Defense Logistics Information Service

The NATO Codification System: The Key to NATO Standardization

Logistics Data & IT Solutions

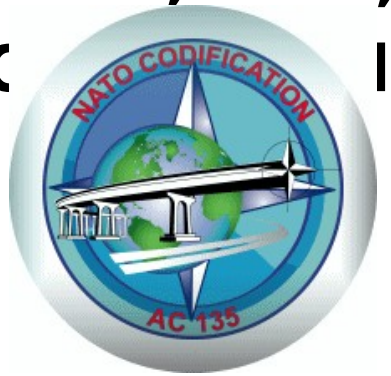
Defense Logistics Information Service

Deputy Chief, International Cataloging Division

Hart-Dole-Inouye Federal Center
74 Washington Ave N Suite 7
Battle Creek, MI 49017-3084

Overview of Presentation

- **Basics about DLIS and the NATO Codification System**
- **Standardization initiatives of NATO Allied Committee 135**
- **Basics about the ECCMA Open Technical Dictionary (eOTD) and the partnership of ECCMA, DLIS, and AC/135**
- **ISO [illegible]ls 22745 and 8000**



America's Logistics Combat Support Ag

Combatant Commanders

UNITED STATES JOINT FORCES COMMAND
USJFCOM
UNITED STATES STRATEGIC COMMAND
UNITED STATES SPECIAL OPERATIONS COMMAND
UNITED STATES SOUTHERN COMMAND
UNITED STATES TRANSPORTATION COMMAND
UNITED STATES CENTRAL COMMAND
HEADQUARTERS United States European Command
UNITED STATES NORTHERN COMMAND

Industrial Commands

Operating Forces

Services

Government Partners

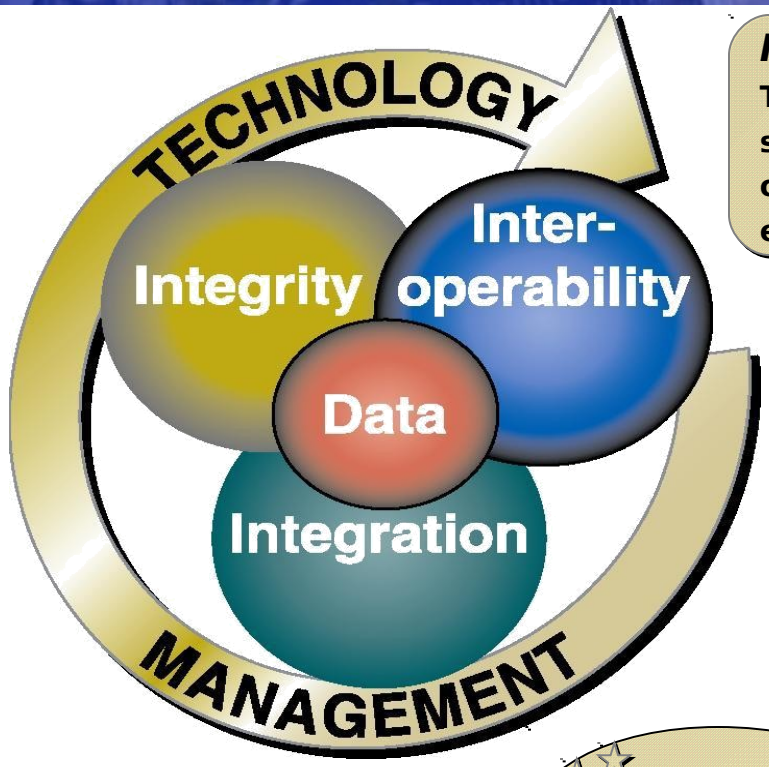
Industry Partners

Global Mission
- 8 DOD Supply Chains
- 21,000 People

Historic Levels of Execution
- $35B Goods & Services
- OEF/OIF
- Disaster Relief Support

Flexible World Wide Presence
- Deployable Distribution
- Contingency Support Teams

Defense Logistics Information Service



Mission…

To provide interoperable, integrated, quality logistics data and en solutions for joint warfighters, the Military Services, the Defense D other Federal agencies and international partners in order to optir effectiveness and efficiency of the DOD Supply Chain.

Business Profile

- **Federal Logistics Information System (FLIS)**
- **Military Engineering Data Asset Locator System (MEDALS)**
- **Technology Mgmt- DLIS/DRMS (Networks / IA / CM / Testing)**
- **Data Integration (LINK / AV / DESX / Meta Data / Master Data / IDE)**
- **Environmental Initiatives (HMIRS / ERLS / EPRO)**
- **Multi-media Information (CD/DVD / On-Line / Tailored Extracts)**
- **DOD Cataloging & Provisioning Support**
- **Software Development (Web / Legacy / Contemporary)**
- **a Quality**
- **lutions (CCR / HD / DC**
- **Nation**

WORLD
Customer Interaction Center
DLIS-Support@dlis.dla.mil
1-877-352-2255
CLASS

Scope of

- **$601.9M DOD EMALL Sales**
- **445,862 products distributed i.e. FEDL**
- **148,446 accounts to online systems**
- **9,334 extracts provided containing over 10.9B records**
- **6.9M active NSNs in FLIS**
- **41.7M technical data assets indexed in MEDALS**
- **286K calls annually**
- **52 critical applications / 97 total applications**

Our most valued resource… our people…1,389 plus

Vision…

We are the premier provider of DOD supply chain da logistics information technology solutions.

The U.S. Cataloging System Today

DLA NSN 1

ONE ITEM OF SUPPLY
SINGLE MANAGER

SINGLE NSN

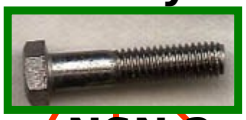
Each military service uses their own logistics “language”

In The Days of WWII

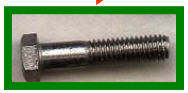
DLA

NSN 1

Army

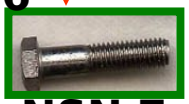


NSN 2



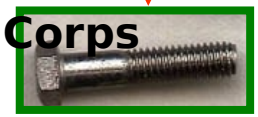
NSN 6

NSN 8



NSN 7

Marine Corps



NSN 3

Navy

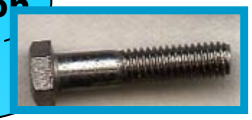
NSN 4

Air Force

NSN 5

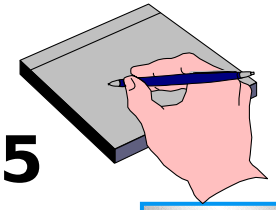
Potential for:
- Multiple NSNs, based on service and weapon system
- Multiple buying activities
- Multiple corporate contracts
- Loss of Interoperability/Asset Visibility

NATO



NSN ?

Codification Chronology



WWII

1945

1949 PL152 SUPPLY CLASSIFICATION

1952 PL436 CODIFICATION SYSTEM

US/UK/CA CLASSIFICATION

1954 STANAG 3150

NATO

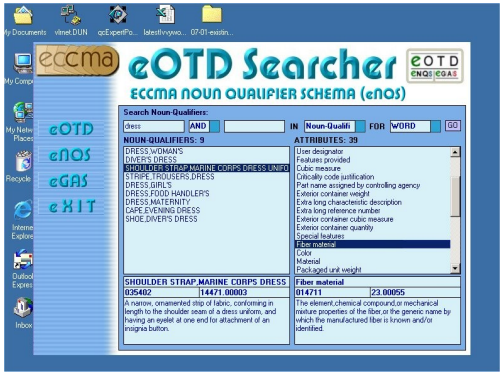
1956 STANAG 3151

1966 DLSC

1974 NCB CODE

1978 CD-ROM

1991 PFP



DESERT STORM

1994 PACS

BASELOG

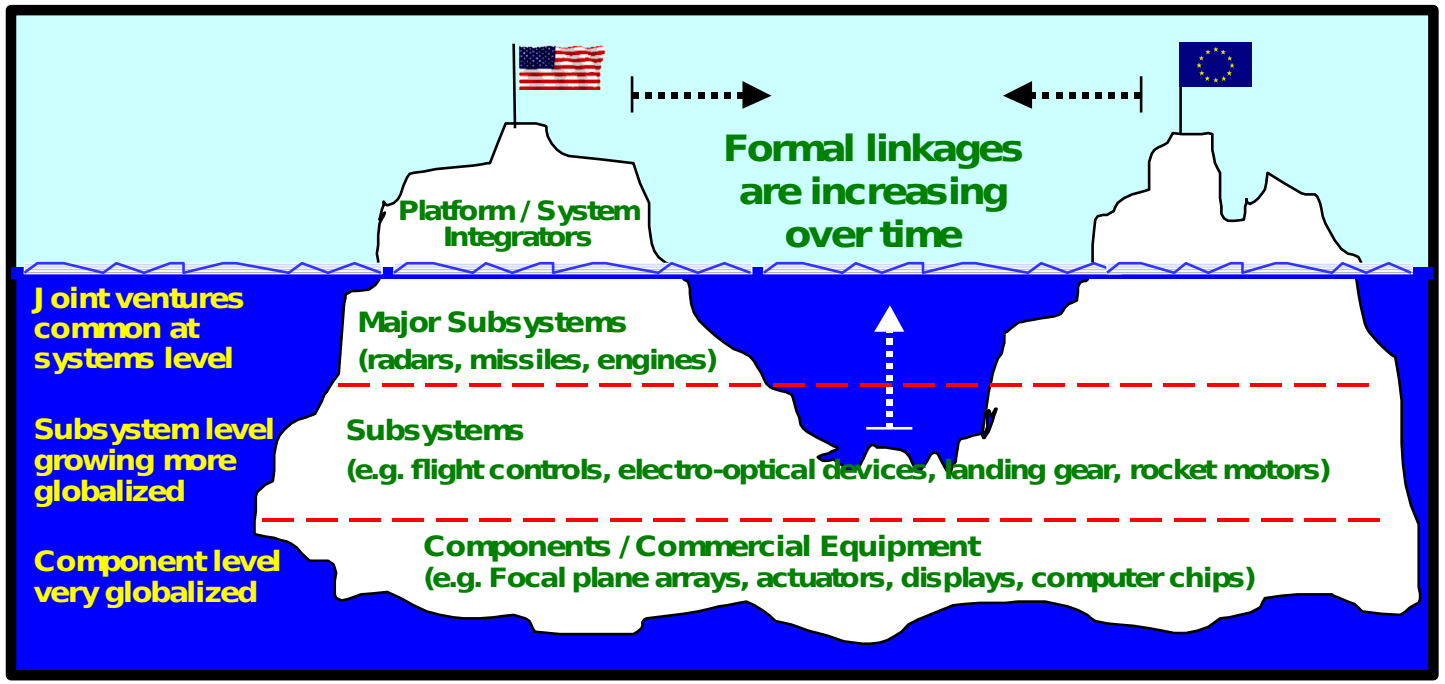
1999 e-Commerce

2002 eOTD / ISO

2007

International Interoperability

An Increasingly Integrated Industrial Foundation Among U.S. and European Allies


Formal linkages are increasing over time
Platform / System Integrators
Joint ventures common at systems level
Major Subsystems
(radars, missiles, engines)
Subsystem level growing more globalized
Subsystems
(e.g. flight controls, electro-optical devices, landing gear, rocket motors)
Component level very globalized
Components / Commercial Equipment
(e.g. Focal plane arrays, actuators, displays, computer chips)

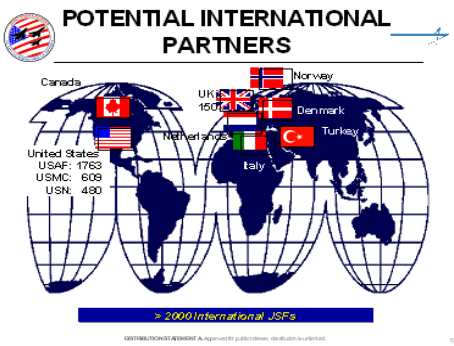
Multinational Cooperation

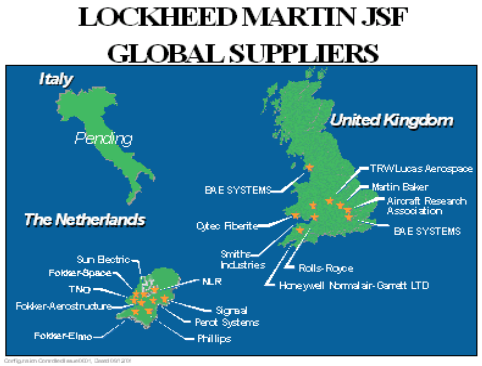
MULTINATIONAL SYSTEMS DEVELOPMENT

ALN	DASA
AS	FLABEL
BAE	TAI
CASA	OPEN

Source: Airt

JSF Partner Nations





The NATO Codification System (NCS)

- A standard for logistic information exchange military units worldwide
- A flexible information system that can be tailored to national requirements
- An important cornerstone to Logistics Interoperability

For more info:
http://www.nato.int/structur/AC/135/redirect/800-e.htm

NCS is Language Interoper

Saya ada NSN di dalam simpanan. (I have the NSN in stock)

Help, I need NSN 6645-00-248-4925

Nie mam w zasobach NSN-a (I have this NSN in stock)

I don't have your NSN... but can order it.
我沒有？要的料號....，但仍可以申請

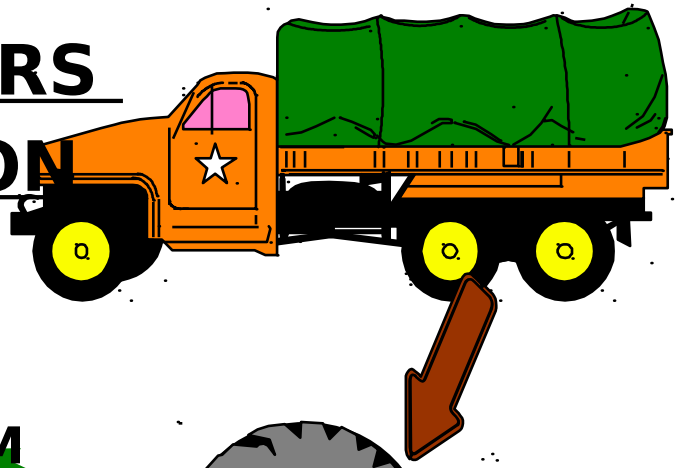
Peaks saabuma varsti (I expect this item soon)

What Is the NATO Codification System?

- **Establishes a common supply language throughout all logistic operations using NSNs**
- **Based on the Federal Catalog System**
- **Enables interoperability**
- **Optimize resource management by minimizing duplication in inventories**

NATO Stock Number (NSN)

MANUFACTURERS IDENTIFICATION SYSTEM



DUNLOP
11-00-20SPTGM

GOODYEAR TIRE CO
11-00-20SRLER

GOODYEAR FRANCE
11-00-20UNISRL

CUP SNC
1100R20GSRT4-16PR

USERS CODIFICATION SYSTEM

NAVY
ARMY
AIR FORCE
OTHER DEPARTMENTS

2610-14-32246

Single Stock Number

Item Description

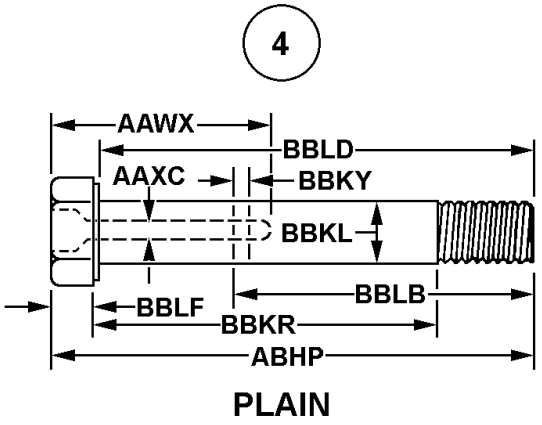
- **Purpose: Determine NSN description changes**
  - **Customer requirements**
  - **Best industry practices**

Characteristics

AAEL - Threads per inch
AAJD - Thread class
AASK - Head Style
AASL - Head Diameter
AATR - Shank Length
AATT - Eye Offset
AAWX - Concentric Hole Depth
AAXC - Concentric Hole Diameter
CQFM - Hardness Rating
CSXG - Offset Angle

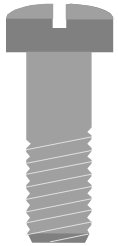
Other Data Elements

- Hazardous
- Environmentally Friendly
- Precious Metals



PLAIN

Line Drawing of a bolt



Picture of a bolt

NSN Statistics

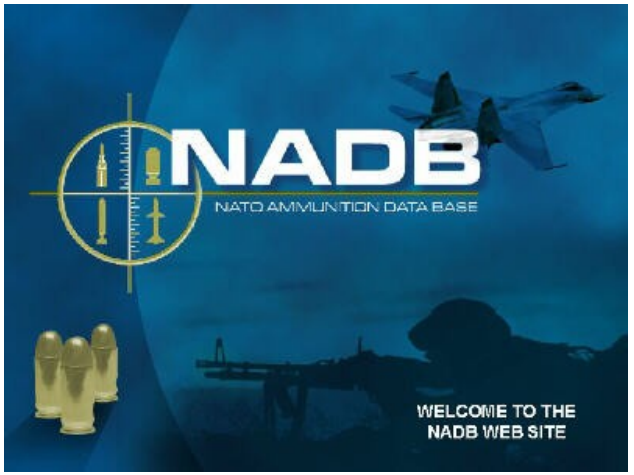
- Approximately 16 million NATO Stock Numbers have been assigned
- More than 6 million by the U.S. and 9 million by the other NATO countries
- Approximately 31 million reference numbers have been registered on these NSNs
- Approximately 1.4 million manufacturers and other organizations are registered
- These NSNs contain more than 22 million user registrations

Who Uses NCS Data?

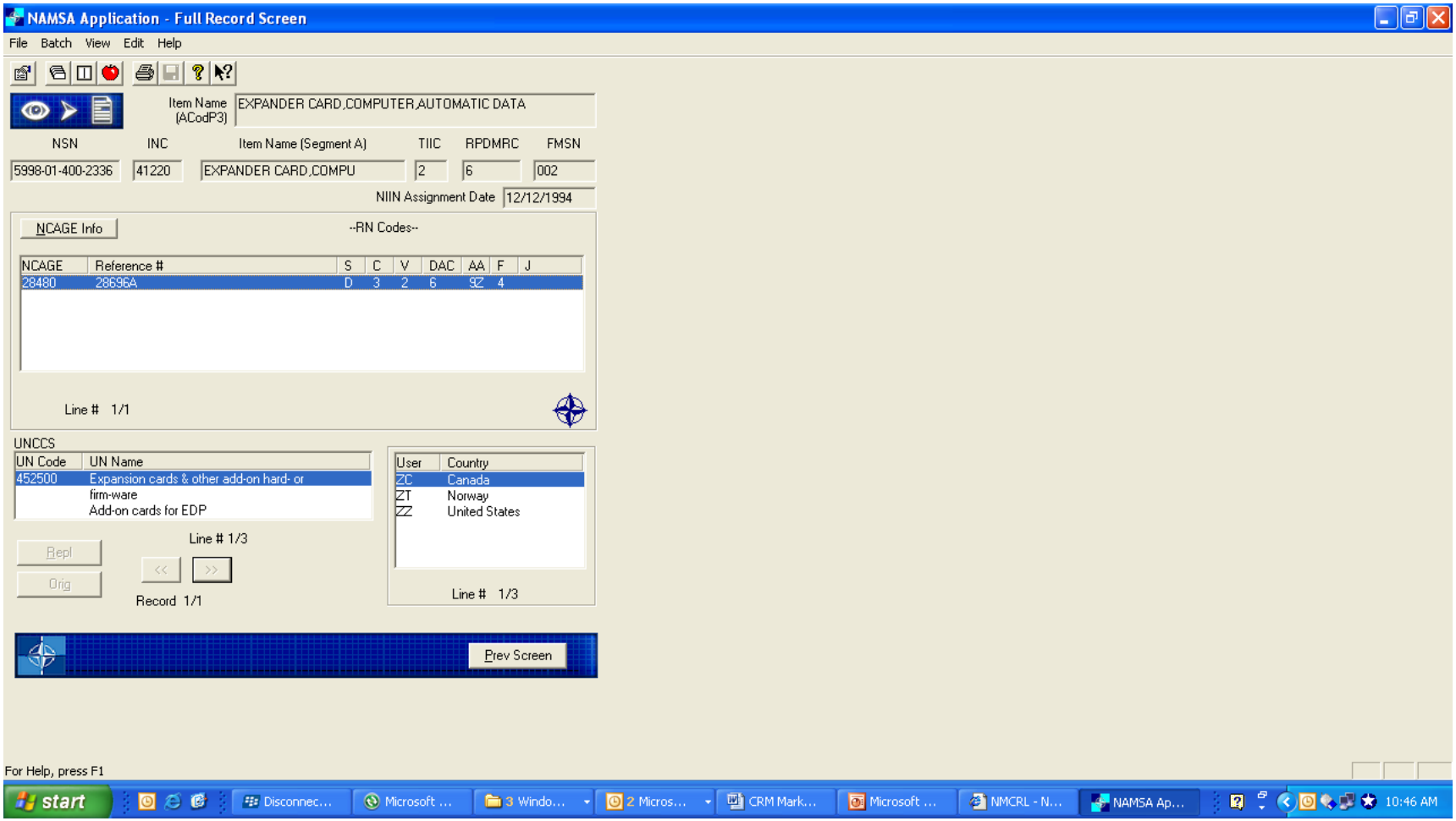
- NCS data is used by soldiers, sailors, airmen and marines in 25 NATO countries and the 28 non-NATO countries that have been sponsored through NATO Allied Committee 135
- The NCS is also used by civilian government agencies in many countries and by many defense contractors
- NCS/NSN data is used across the entire logistics—from acquisition, maintenanc and disposal

Where Can NCS Data be Obtained?

- NATO products and publications
  - NATO Master Catalogue of References for Logistics (NATO MCRL)
  - NATO Ammunition Database (NADB)
  - Allied Codification Publications 2/3
  - National publications

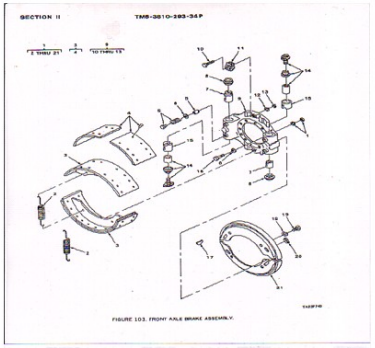


NSN Data in NATO MCRL



Codification In Logistics

IN MAINTENANCE

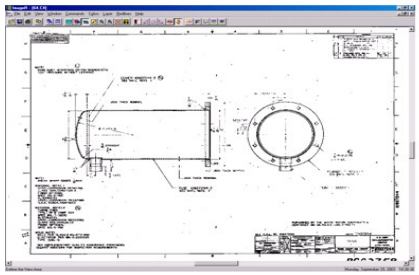


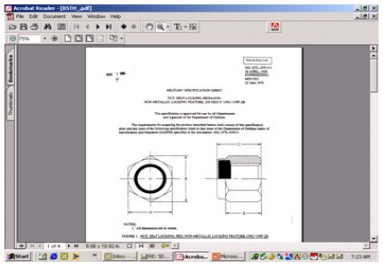
WHERE CAN IT BE ORDERED?
HOW MUCH DOES IT COST?

ACQUISITION AND PROCUREMENT

CAGE/PART NUMBER FOR
(19207) 10937244 (96906)MS51922-017

ENGINEER DRAWING or SPECIFICATION





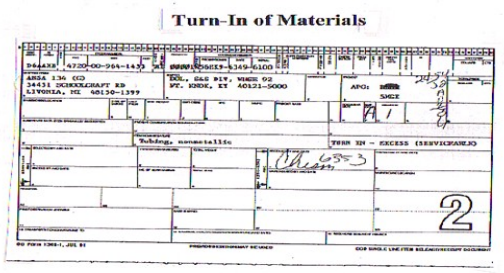
IN WAREHOUSE

Is there Hazardous Content?

Does it give off an Electrostatic Discharge?

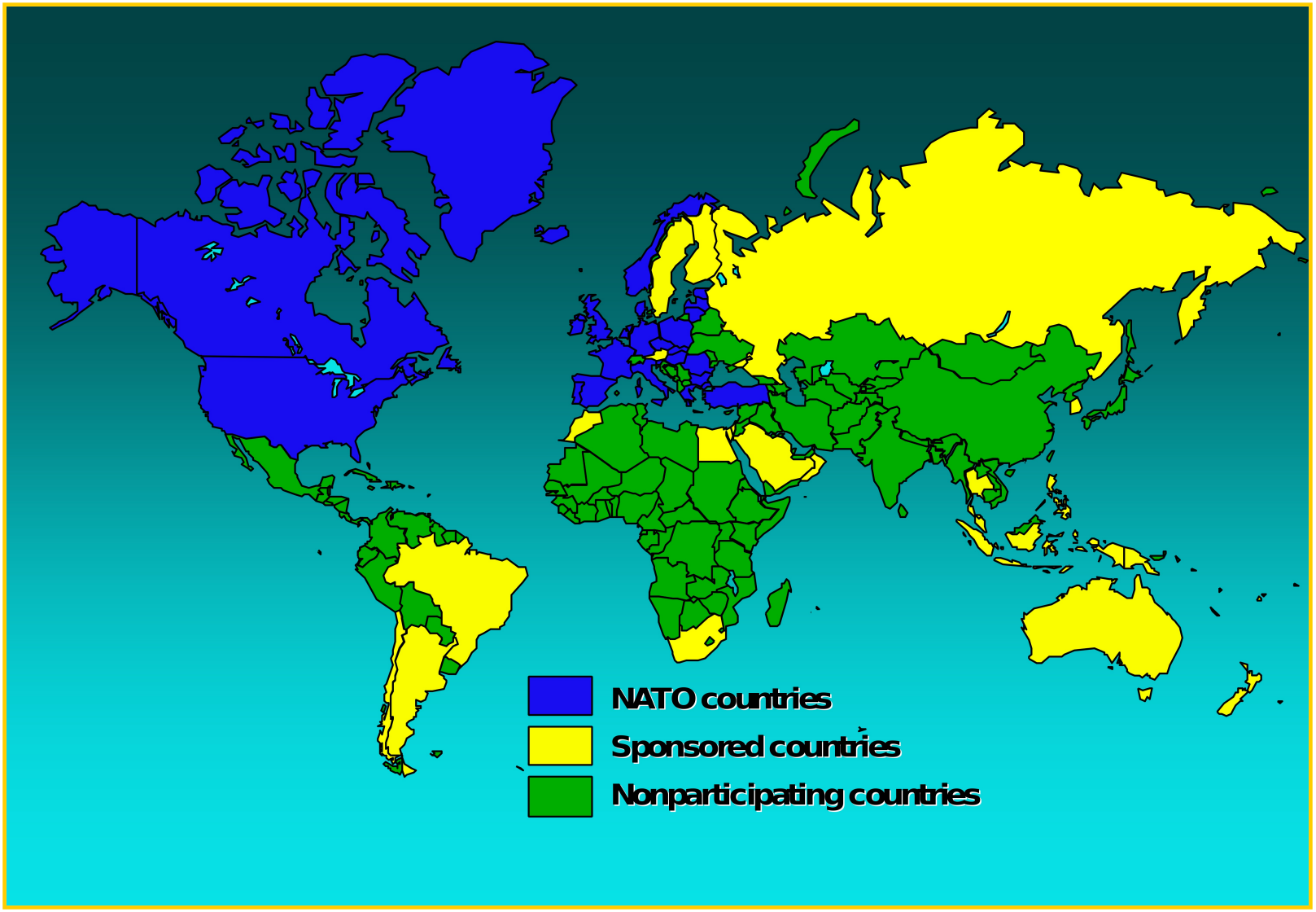
Does it have a Shelf Life?

USE IN BUSINESS TRANSACTIONS

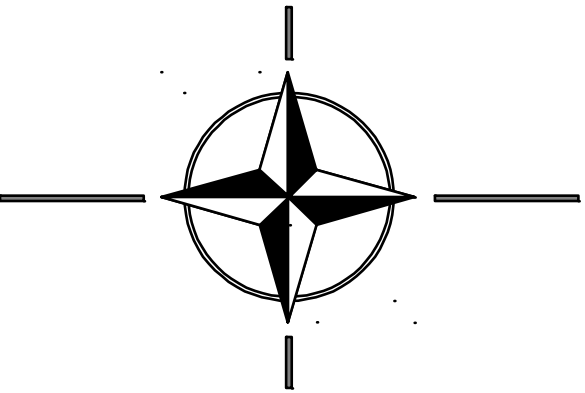


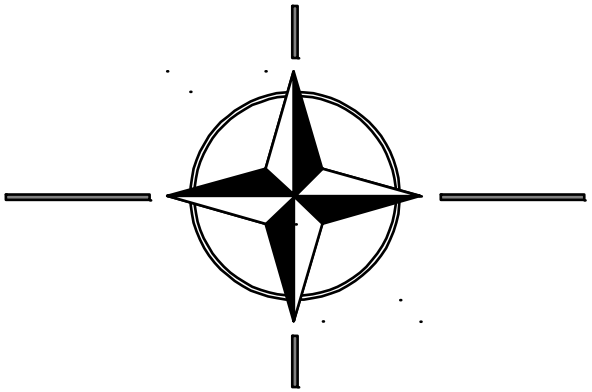
IF FOR DISPOSAL:
DEMILITARIZATION?
PRECIOUS METALS RECOVERY?

Countries Using NATO System



AC/135 Within NATO





North Atlantic Council

Production Logistics Conference of National Armaments Director

The Group of National Directors (AC/135) of Codification (Main Group)

AC/135 Panel A On General Matters/Procedures concerning Codification (Panel A)

AC/135 Panel A Ad Hoc Task Groups

AC/135 and NATO Standardization

- Cooperates with NATO Agency for Standardization (NAS) and recently established an official liaison
- Active liaisons with Asset Tracking Working Group and AC/327 (Product Life Cycle Support)
- Has worked with Military Committee Terminology Conference (MCTC) on harmonizing terminology across NATO

The ECCMA Open Technical Dictionary

- **The ECCMA Open Technical Dictionary (eOTD) was developed by ECCMA in partnership with DLIS and NATO Allied Committee 135**
- **ECCMA is the Electronic Commerce Code Management Association**

The ECCMA Open Technical Dictionary

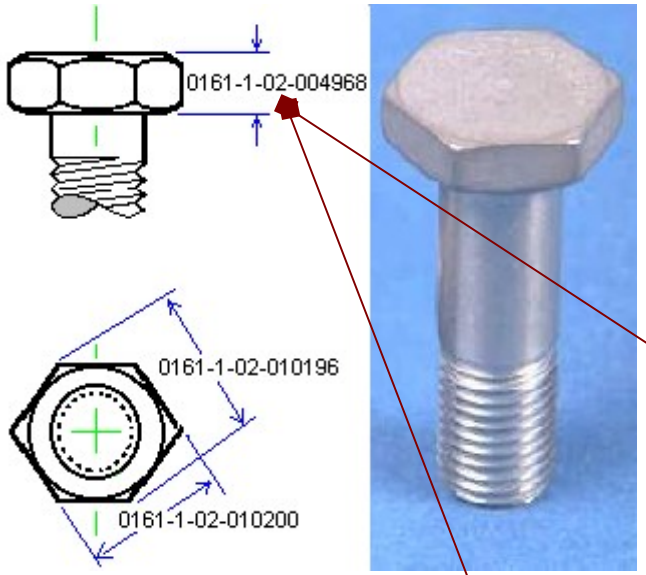
- **The ECCMA Open Technical Dictionary (eOTD) is an open technical dictionary of cataloging concepts used to create unambiguous language independent descriptions of *individuals, organizations, locations, goods and services***
- **The ECCMA Open Technical Dictionary (eOTD) is based on the NATO Codification System (NCS) with a more modern database architecture oriented toward the commercial world**

eOTD
ECCMA Open
Technical Dictionary

Common Terminology = Common Mapping

Machine Bolt; Product Number: 3225020037; Nominal thread diameter: 1.0 inches; Width across flats: 1.450 inches; Width across corners: 1.653 inches; Head height: 0.591 inches; Count per pack: 10; Pack price: $0.80

Rendered



Property ID	Value	Measure ID
0161-1-02-046898	0161-1-07-014684	
0161-1-02-027375	3225020037	
0161-1-02-023822	1.0	0161-1-05-000798
0161-1-02-010200	1.450	0161-1-05-000798
0161-1-02-010196	1.653	0161-1-05-000798
0161-1-02-004968	0.591	0161-1-05-000798
0161-1-02-027376	10	
0161-1-02-027378	0.80	0161-1-08-000168

eOTD Coded

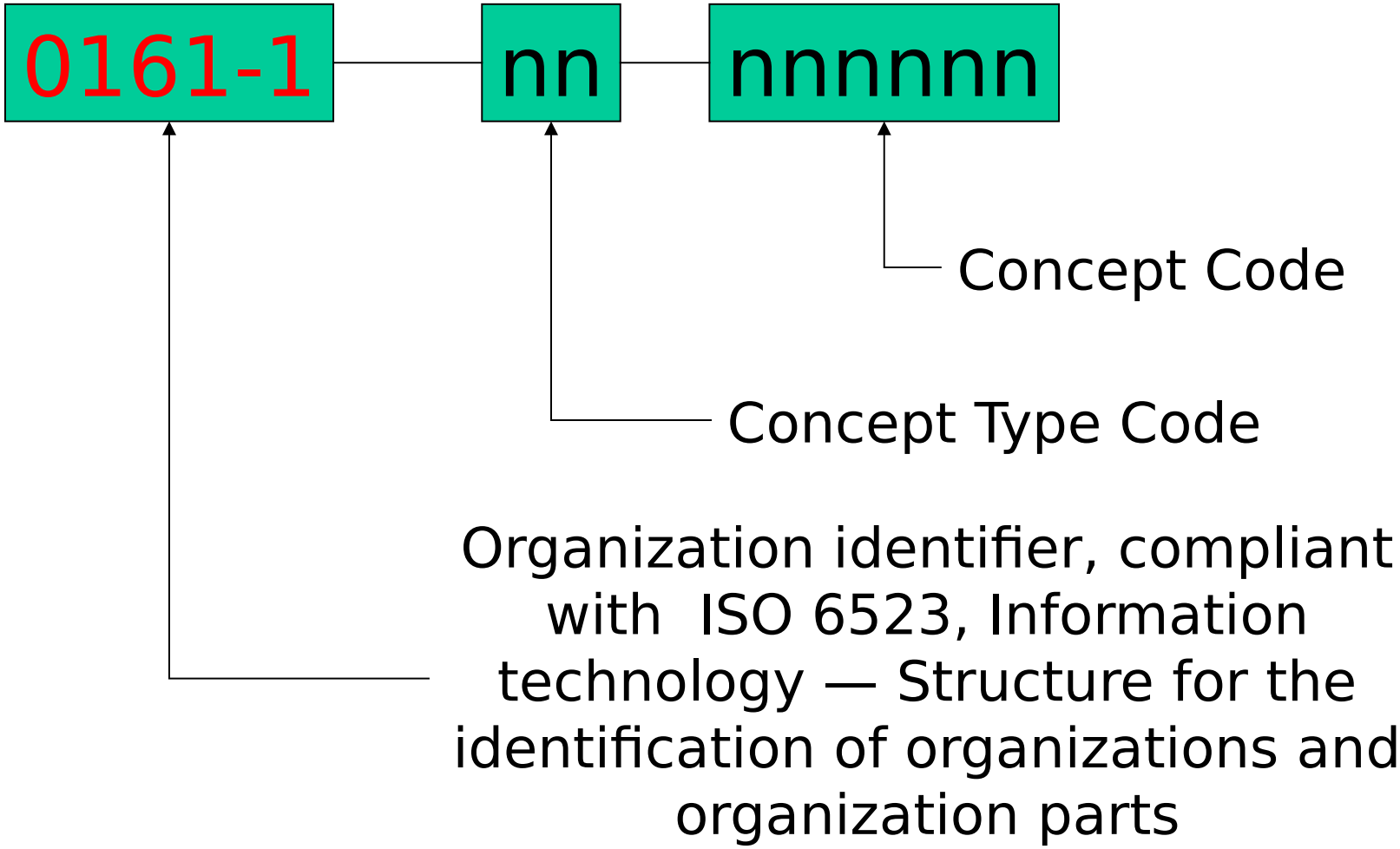
XML

Property term	Value	Measure term
eOTD CLASS NAME	BOLT:MECHANICAL	
PRODUCT NUMBER	3225020037	
NOMINAL THREAD DIAMETER	1.0	INCHES
WIDTH ACROSS FLATS	1.450	INCHES
WIDTH ACROSS CORNERS	1.653	INCHES
HEAD HEIGHT	0.591	INCHES
COUNT PER PACK	10	
PACK PRICE	0.80	US DOLLAR

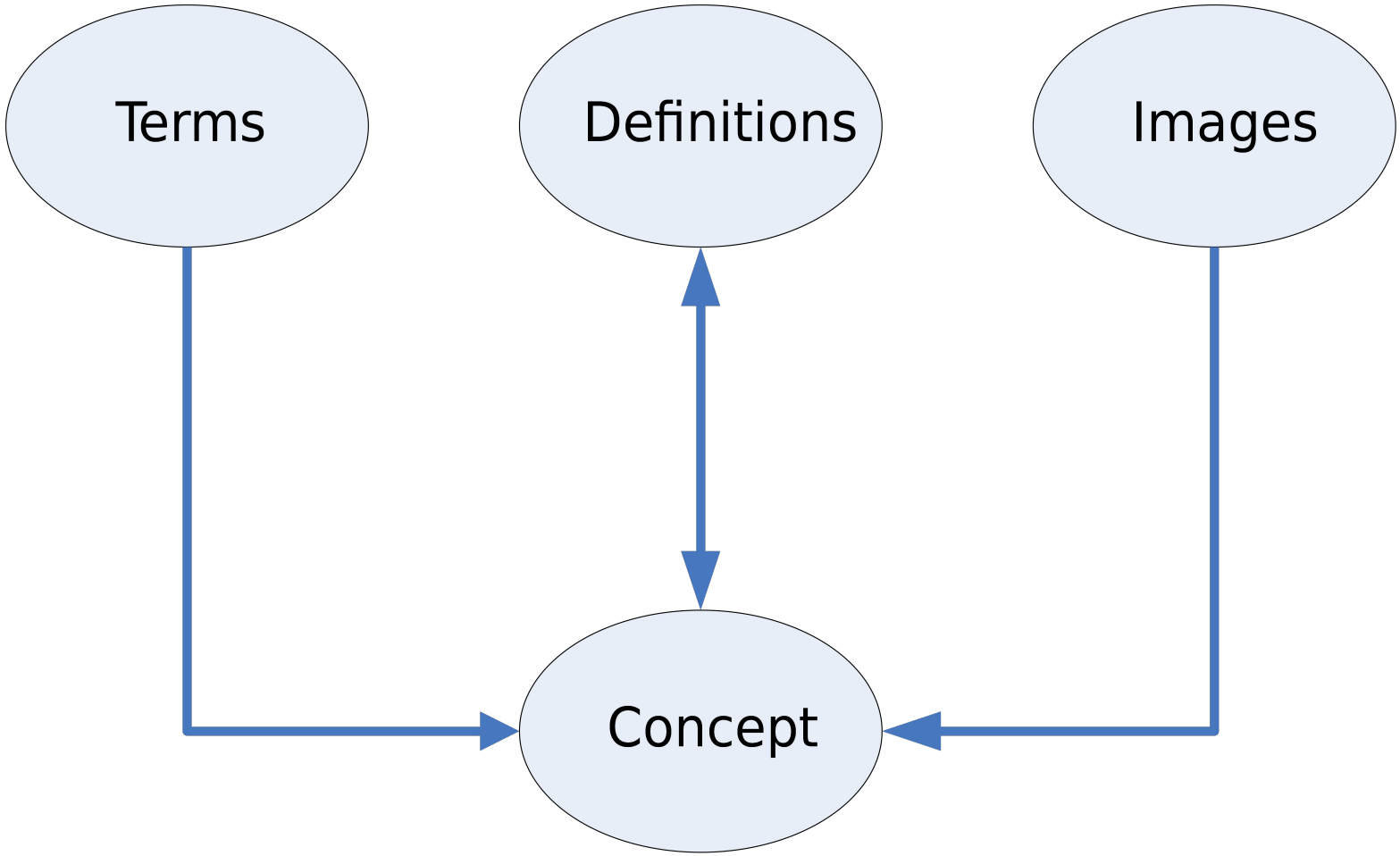
Identifiers Resolved

eOTD

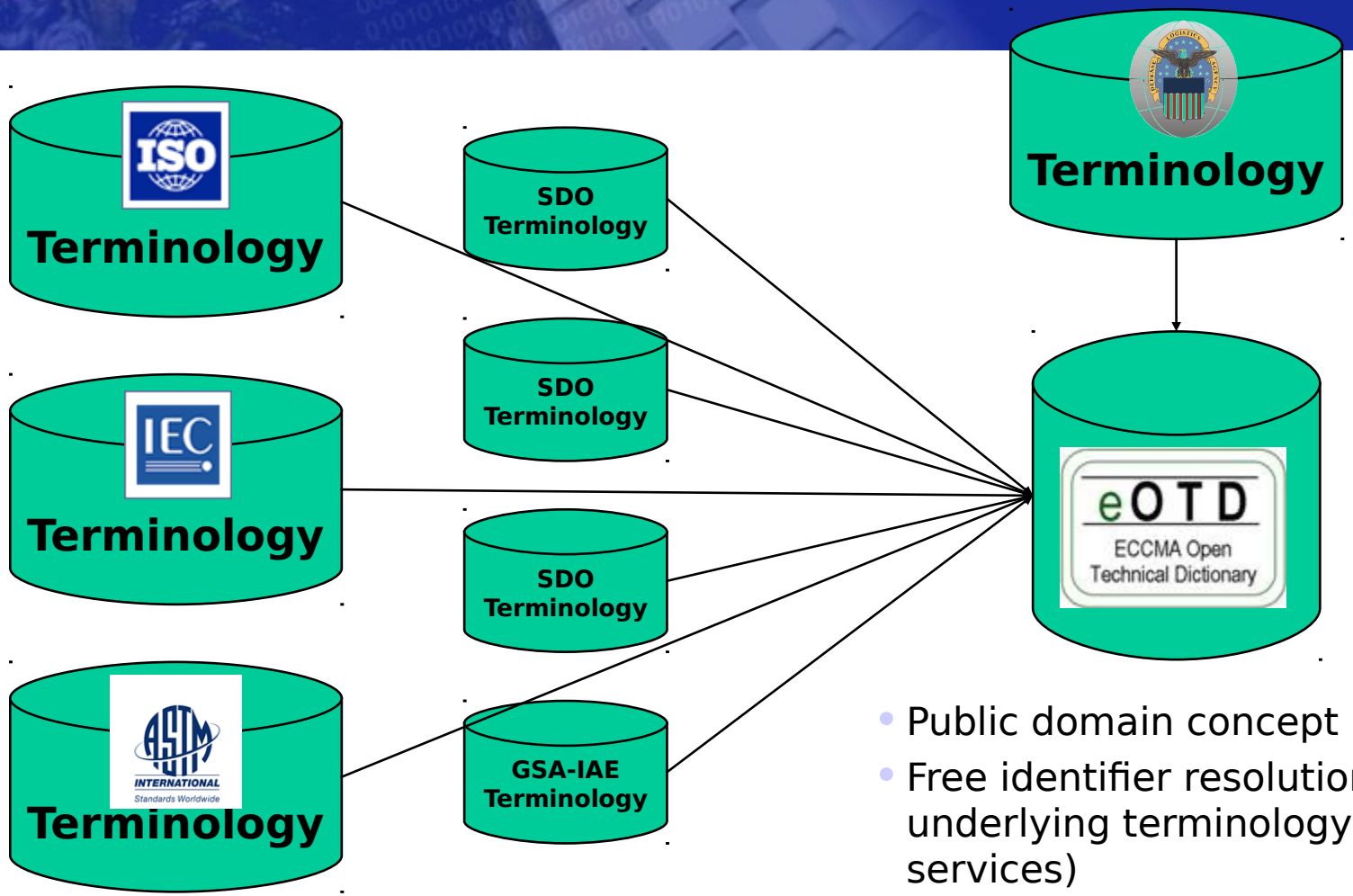
Globally Unique Identifiers


0161-1
nn
nnnnnn
Concept Code
Concept Type Code
Organization identifier, compliant with ISO 6523, Information technology — Structure for the identification of organizations and organization parts

eOTD Dictionary



Standard Terminology



- Public domain concept identifiers
- Free identifier resolution to underlying terminology (web services)
- Hyperlink to source standards
- Multilingual
- Multiple terms, definitions and images linked to single concept identifier

eOTD Service - Mozilla
File Edit View Go Bookmarks Tools Window Help
http://registry.eccma.org/eotd/concept?id=0161101006362
Search
Home Bookmarks Google Wikipedia M-W Yahoo! Bills JDK 1.4 Docs JDK 1.4 API APIs Intranet New ESN Registry ECCMA Intranet
eOTD Service
HTML 4 Document Type Definition

Site Map
Contact Us
FAQ
Glossary
Home

Names | | Definitions | | Images

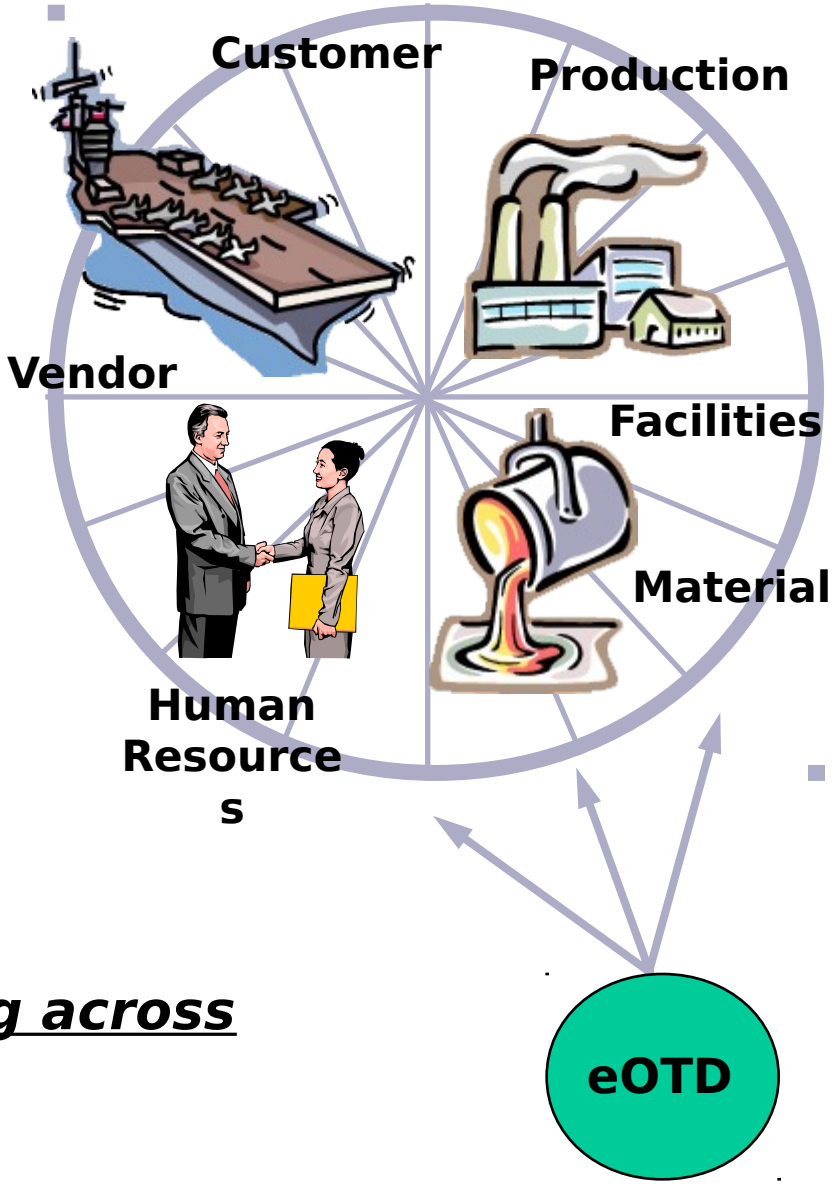
Concept Detail: 0161-1-01-006362

Concept Names	
Name	**Standard References**
BALL SCREW	ISO/DIS 3408-1
BALLSCREW ASSEMBLY	FIIG A305

Concept Definitions	
Definition	**Standard References**
An assembly comprising a ball screw shaft, ball nut(s) and balls, and which is capable of converting rotary motion to linear motion and vice versa. The rolling elements of the assembly are balls. *Notes* • Depending on the application, ball screws are designed either with backlash or without backlash (preloaded). • To meet individual requirements six standard tolerance grads 0, 1, 3, 5, 7 and 10 are available. The tolerances for travel deviation are in accordance with the standard tolerance grads IT0, IT1, IT2, IT5, IT7 and IT10 of ISO 286-1:1988, ISO system of limits and fits - Part 1: Bases of tolerances, deviations and fits. Usually standard tolerance grade 0 to 5 are preloaded, and grades 7 and 10 are not preloaded.	ISO/DIS 3408-1
A self-contained power transmitting device designed to convert rotary motion to linear (straight line) mechanical movement. Must be comprised of a ball nut, pillow block(s), screw shaft and such accessories as required for the specific moving and positioning of other components.	FIIG A305

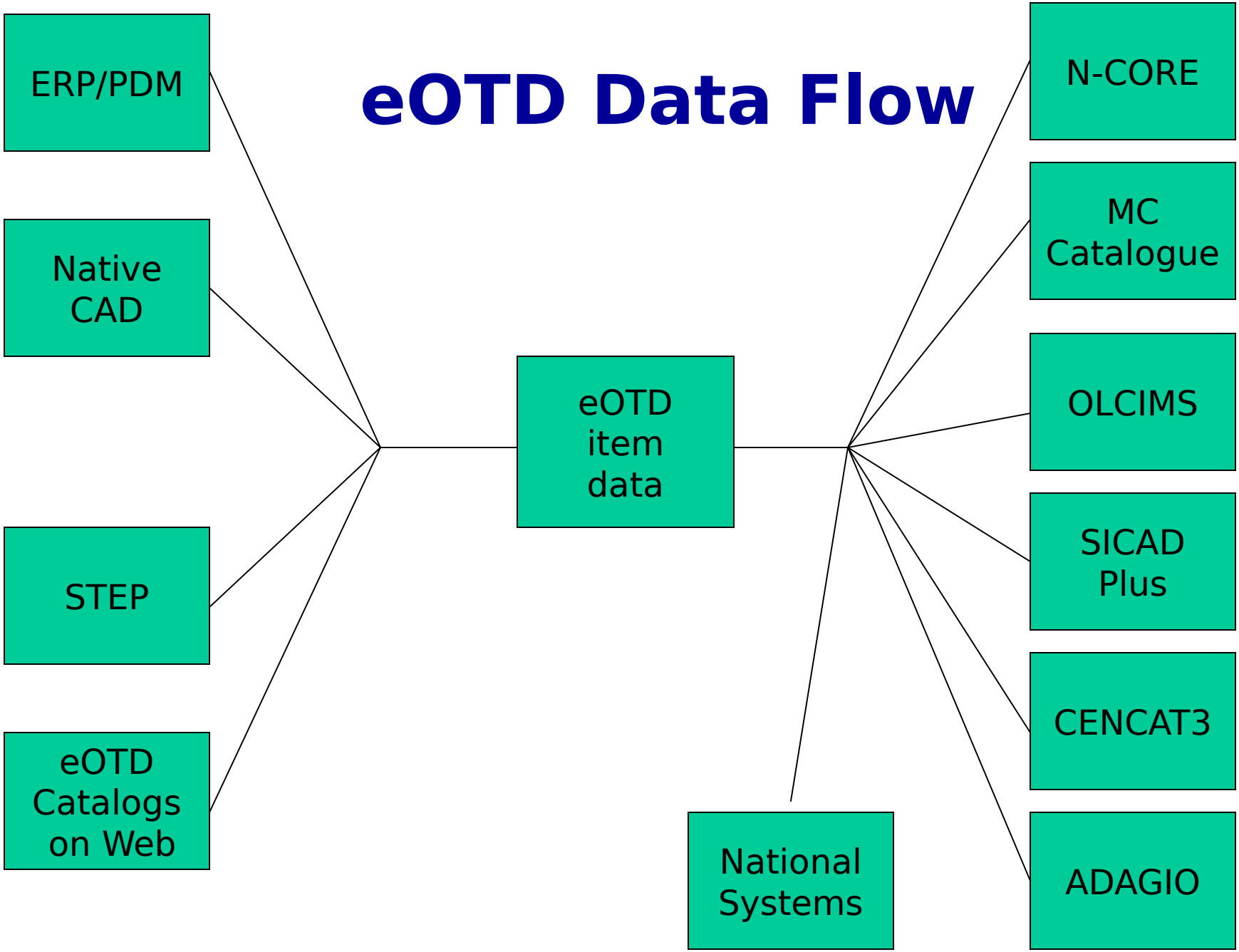
Common Concept Encoding

- Across the supply chains
- ERP masters: vendor/customer/material
- Manufacturing/production
- Facilities/raw materials
- Human resources
- Data life cycle management – design through disposal



Common metadata mapping across applications

eOTD Data Flow



ISO 22745: eOTD as International Standard

- Fundamentals of ISO Standard 22745:
  - Embodies eOTD metadata into international standard
  - Integrates cataloging into design (CAD/CAM) files
  - ISO 22745 describes eOTD and explains how codification data can be tagged in STEP design files (ISO 10303) in a standardized manner
  - Mine Enterprise Resource Planning Systems (like SAP) for catalog data and convert to eOTD data

Parts of ISO 22745

Part 1:	**Overview**
Part 2:	**Terminology: Defines the terms used in 22745**
Part 10:	**Dictionary representation**
Part 11:	**Guidelines for the formulation of cataloging terminology**
Part 13:	**Identification of concepts and terminology**
Part 14:	**Dictionary query interface: How to establish Web services interfaces for catalogs**
Part 20:	**Procedures for the maintenance of an Open Technical Dictionary**
Part 30:	**Identification guide representation**
Part 40:	**Catalogue representation**

Parts shown in red are being designed jointly with Parts L
team and will be published in ISO 29002

eOTD
ECCMA Open
Technical Dictionary

Parts of ISO 22745

Part 50: Structure and operation of the Registration Authority\

Part 200: Implementation guide for incorporating cataloguing information into ISO 10303 product data

Part 300 Generic templates for commonly used types of master data

- Organization master
- Material master (equivalent to NSN data)
- Asset master
- Service master
- Process master
- Location master
- Person master
- Material Safety Data Sheet (MSDS)

Transformation Through Automation

Before

- use of disparate sources of non-digital design data
- reliance on potentially subjective human judgment
- operate as an additional process

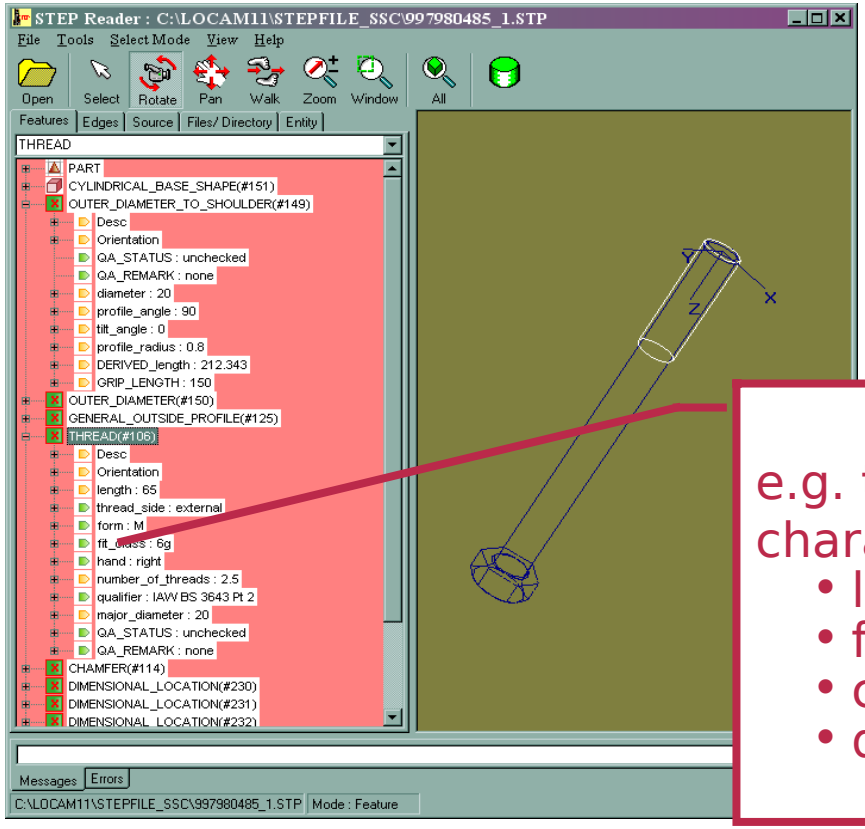
After

- use of digital design data in standard formats
- support for cataloging decisions in computer software
- perform cataloging at design time (cataloguing at source)

impact: faster, better, cheaper

ISO 22745: Automation of Cataloging

- **Mapping Catalog Data from Source Data**



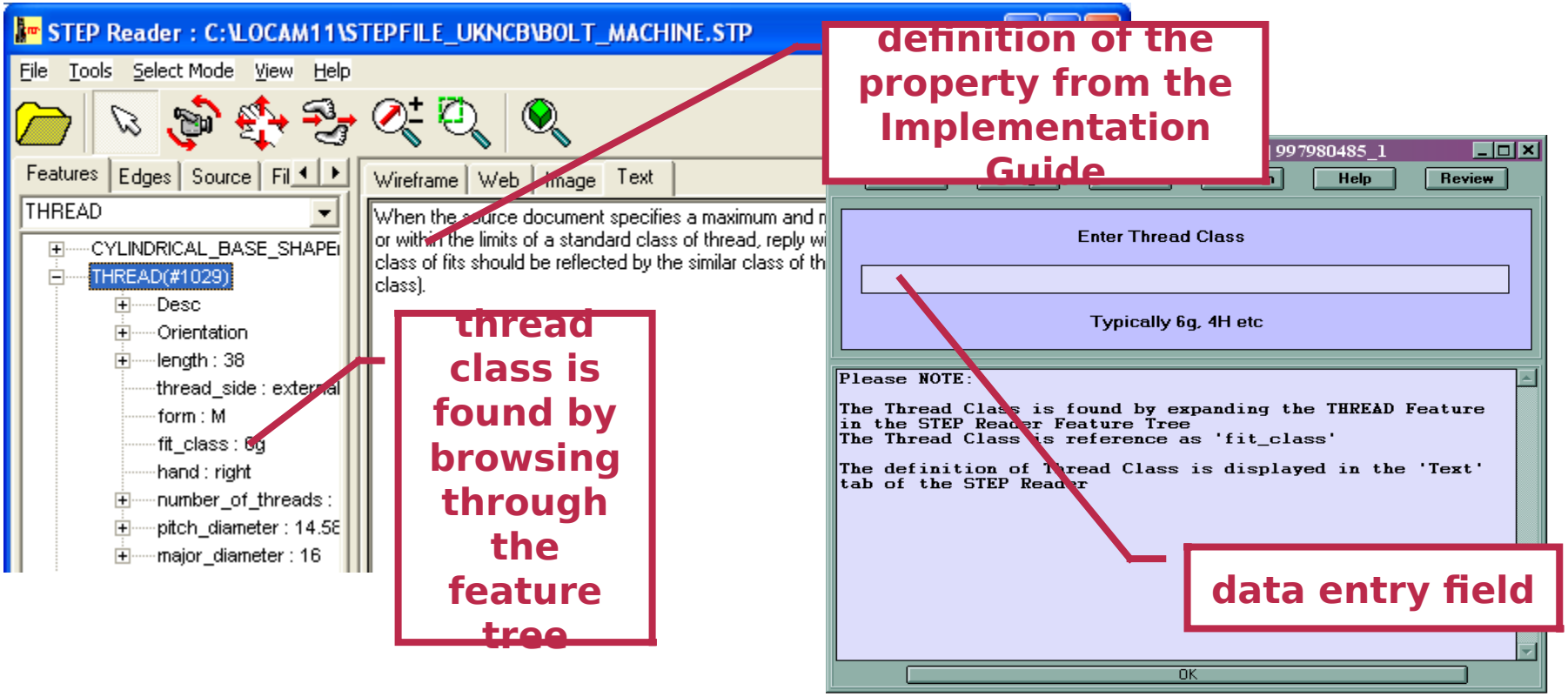
features

e.g. thread characteristics including

- length (65 mm)
- form (ISO M)
- class (6G)
- diameter (20 mm)

ISO 22745: Automation of Cataloging

- **Create data one time and use throughout life cycle**


STEP Reader : C:\LOCAM11\STEPFILE_UKNCB\BOLT_MACHINE.STP
File Tools Select Mode View Help
Features Edges Source
THREAD
CYLINDRICAL_BASE_SHAPE
THREAD(#1029)
Desc
Orientation
length : 38
thread_side : external
form : M
fit_class : 6g
hand : right
number_of_threads :
pitch_diameter : 14.58
major_diameter : 16
Wireframe Web Image Text
Help Review
Enter Thread Class
Typically 6g, 4H etc
Please NOTE:
The Thread Class is found by expanding the THREAD Feature in the STEP Reader Feature Tree
The Thread Class is reference as 'fit_class'
The definition of Thread Class is displayed in the 'Text' tab of the STEP Reader
OK
definition of the property from the Implementation Guide
thread class is found by browsing through the feature tree
data entry field

Benefits to Government

- **Opportunities for improvement of FLIS and the NATO Codification System through increased industry participation**
- **Promotes FCS/NCS approach as an ISO standard**
- **Lower cost of cataloging: Reduction of labor hours**
- **Higher quality data through direct import of data from manufacturers catalogs**

Goal: Electronic transfer of descriptive data from our suppliers and manufacturers to NCBs

The Value

ANGLO COAL

52368965412 – Tyre Bridgestone 435/95 R25

ANGLO BASE METALS

56329845 – Tyre BS 435/R25 Standard Purpose E3 2 Star Radial

ANGLO PLATINUM

125435 – Bridge Stone 25inch 435/95

KUMBA RESOURCES

965123465 – Tyre Bridgestone Part Number 12345

One Common Anglo Numb

Standardised Long Description:
Tire: Pneumatic, Vehicular: Service Type for Which Designed: Loader Tire Rim Nominal Diameter: 25' Tire Width: 445mm Aspect Ratio: 0.95 Tire Ply Arrangement: Radial Ply Rating: 2* Tire & Rim Association Number: E3 Tread Material: Standard Tire Air Retention Method: Tubeless Tire Load Index and Speed Symbol: NA Tread Pattern: VHB TKPH Rating: 80

Standardised Short Description:
Tire Pneumatic: Loader 25‘ 445mm 0.95 2*

“Boeing currently buys 200 different kinds of safety glasses and 80 different shades of white paper. The defense and commercial aircraft divisions each negotiate for their own aluminum and titanium. Why can't we buy two or three kinds of safety glasses? Why can't we have standard part numbers that go across the enterprise?"

James F. Albaugh, CEO Boeing Integrated Defense Systems,
Business Week March 13, 2006

BOEING

Boeing Technology
Phantom Works

Phantom

The eOTD is a foundation for design collaboration and industry standards.

ISO 22745 and the eOTD are the foundational enablers for the breakthrough our industry needs in the next generation of direct, accurate, and effective collaboration across the supply chain at meaningful and granular levels of data exchange never before imagined.

Senior Manager,
IDS Engineering Standards Control Function

PW Knowledge and Reuse Management (KARMA)

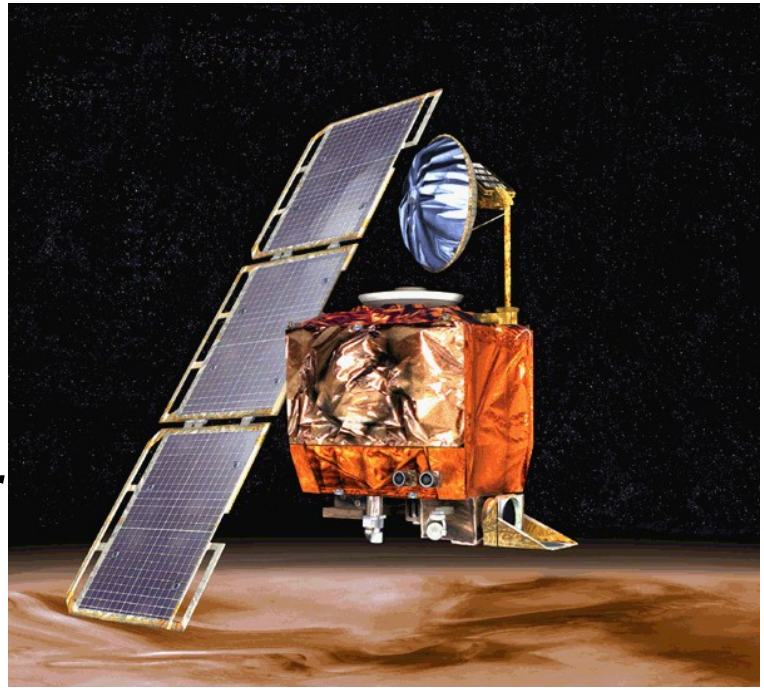
ISO 8000: A Standard for Data Quality

- Fundamentals of ISO Standard 8000:
  - Set standards and a certification process for data quality
  - Encompasses data quality but can easily be extended into all types of data quality
  - Defines different areas of data quality
    - Provenance
    - Traceability
    - Currency
    - Completeness

How Expensive Can Bad Quality Data Be?

In this case $125,000,000

The price of a Mars Climate Orbiter



Mars Orbit Insertion Burn	M/D/Y HH:MM:SS PDT (Earth Receive Time, 10 min. 49 sec. Delay)	Distance (miles)	Speed (miles/hr)	Force (Pounds)
Begin	9/23/99 02:01:00	121,900,000	12,300	143.878
End	9/23/99 02:17:23		9,840	

Mars Orbit Insertion Burn	YYYYMMDD EDT (Earth Receive Time, 10 min. 49 sec. Delay)	Distance (km)	Speed (km/sec)	Force (Newtons)
Start	19990923 05:01:00	196,200,000	5.5	640
Finish	19990923 05:17:23		4.4	

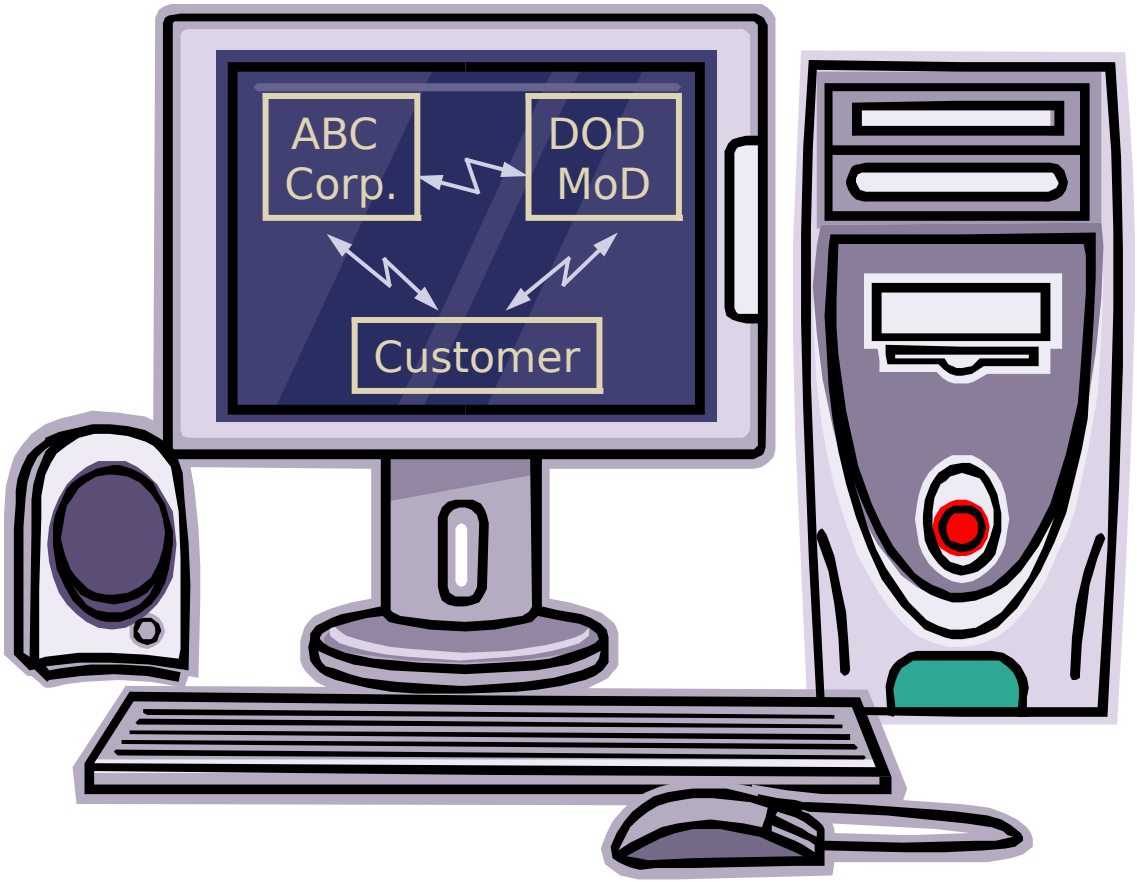
Data Quality

Benefits of ISO 8000

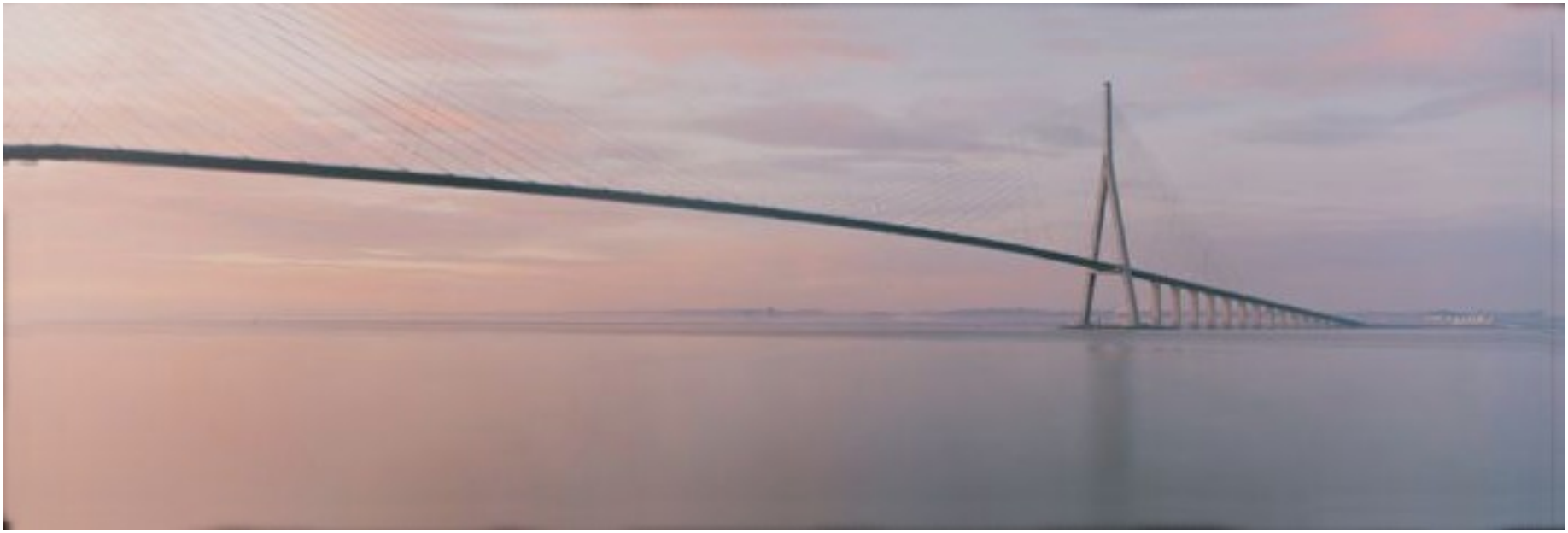
- **Saving money right from the start**
  - **$1 to correct an error at data entry**
  - **$10 to correct a number of errors after the fact with batch processing**
  - **$100 cost of not correcting ar**
- **Benefits**
  - **Eliminates time to reconcile data**
  - **Alleviates customer dissatisfaction**
  - **Prevents loss of system credibili**
  - **Eliminates system downtime**
  - **Prevents some revenue loss**
  - **Assists with compliance issues**

Future Vision

- eOTD encoded information in XML resident on government and industry websites
- Accurate and seamless data retrieval



The NATO Codification System



The Bridge to Interoperability